

adjusting the power level of the desensitization signal based on the changing system operating parameters of the wireless communication system; and

communicating to the source of the received signal a new power transmission level of the received signal based on the level of the desensitization signal.

11. (Amended) In a wireless communication system, a receiver having a receive path for receiving a signal, said receiver comprising:

a desensitization signal source that is capable of producing a desensitization signal on a desensitization signal path;

a coupler connected to said desensitization signal path and said receive path and injects said desensitization signal into said receive path to raise the noise level on said receive path relative to the signal level without attenuating the received signal on said receive path so as to desensitize the receiver;

means for dynamically adjusting the power level of the desensitization signal based on the changing system operating parameters of the wireless communication system; and

means for communicating to the source of the received signal a new transmission power level of the received signal based on the level of the desensitization signal.

R E M A R K S

In response to the Office Action mailed February 28, 20001, independent claims 1 and 11 have been amended to more clearly define applicants' invention. Amended independent claims 1 and 11, each now recites that the desensitization signal is injected into the receive path to raise the noise level on the receive path relative to the signal level without attenuating the received signal so as to desensitize the receiver. Moreover, each

independent claim has been further amended to recite that the power level of the desensitization signal is dynamically adjusted based on the changing system operating parameters, such as, for example, received signal power, frame error rate and/or bit error rate. And, that the new power transmission level of the received signal is communicated to the source thereof based on the level of the desensitization signal. See amended claims 1 and 11. No new matter has been added.

Attached hereto is a marked-up version of the changes made to the claims. The attached page is captioned **"Version With Markings To Show Changes Made."**

Applicants also submit herewith three (3) sheets of formal drawings for Figs. 1-7 for the Examiner's approval.

In the present Office Action mailed February 28, 2001, the Examiner has rejected claims 1-17. More specifically, claims 1-4, 9-13, and 15-16 have been rejected under 35 U.S.C. §102(b) as being anticipated by Stengel et al. Furthermore, claims 1-5, 7 and 11-16 have been rejected under 35 U.S.C. §102(b) as being anticipated by Hall et al. Claims 6 and 7 have also been rejected under 35 U.S.C. §103 as being unpatentable over Hall et al.

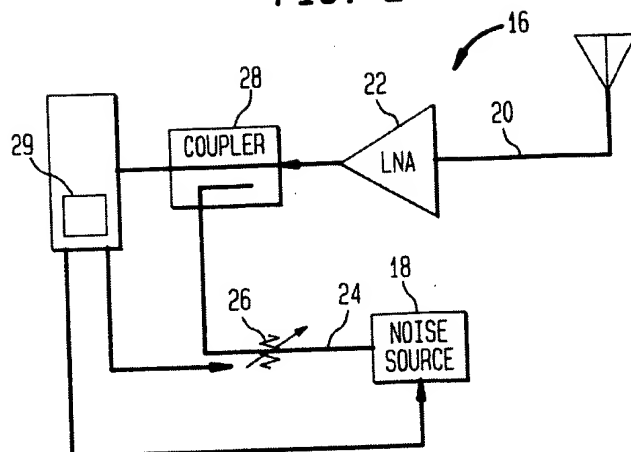
The other cited references, namely, Menant is generally applied against the limitations further recited in dependent claim 8, rejected under 35 U.S.C. 103(a).

In many cellular communication systems, the power level transmitted by mobile units is controlled by the serving base station. This is done so that the mobile unit transmits the lowest power level necessary to maintain a good quality link to the base

station. However, in some cases, it may be desirable to reduce the sensitivity of the wireless receiver at the base station. For example, it may be desirable to so-called "desensitize" the base station so that the base station believes that the mobile unit is farther away than it really is. In doing so, the base station will then instruct the mobile unit to maintain a higher transmit power so as, for example, to overcome potential interferers because of the greater distance. Also, in some CDMA systems where a small coverage area is embedded within a larger cell (macrocell), corresponding base station receivers may send conflicting power control information to the mobile unit(s). To ensure that the transmitted power of the mobile unit(s) at a boundary handoff is high enough it may be necessary to desensitize the microcell so that it instructs the mobile unit to maintain a higher power than it normally would.

Applicants' invention is directed to a method and system for desensitizing the base station receiver. This is accomplished by injecting a so-called "desensitization" signal onto the receive path of the wireless receiver without attenuating the received signal down towards the noise level. Importantly, the level of desensitization can be dynamically adjusted based on changing system operating parameters, such as the received power level, frame error rate (FER), and/or bit error rate (BER). That is, the system operating parameters can be examined so as to determine the level of desensitization necessary. Based on the desensitization level, a new power transmission level for the received signal is communicated to its source so that the mobile unit maintains a sufficiently high signal power level to ensure, for example, a proper boundary handoff.

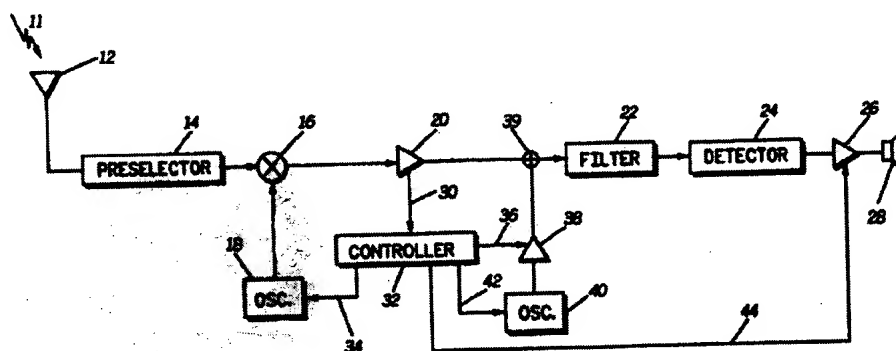
FIG. 2



Referring to Fig. 2 of the specification, reproduced herein above, there is shown a front end (16) of a wireless receiver utilizing the principles of the invention. A broadband noise source (18), such as a noise diode, is used to inject a desensitization signal onto a receive path (20) at a point after the output of a low noise amplifier (20). The noise source (18) as well as an adjustable attenuator (26) is on a desensitization path (24). A coupler (28) on the receive path (20) receives as an input the desensitization path and injects the desensitization signal into the receive path (20) to desensitize the receiver using the broadband noise from the noise source (18). The variable attenuator (26) provides the ability to adjust the amount of noise power to be injected into the receiver path (20). As the power level of the desensitization signal approaches or exceeds the amplified noise power level, the desensitization signal contributes more to the overall combined noise figure, so desensitization can be realized.

The receiver desensitization system desensitizes the receiver

without attenuating the received signal. A control circuitry (29) dynamically adjusts the desensitization level depending upon a variety of parameters, such as the received signal level, frame error rate (FER) and/or bit error rate (BER). That is, the control circuitry (29) sends a control signal to set the desensitization level based on the changing system operating parameters. Based on the desensitization level, a new transmission power level for the received signal is sent to the source of the received signal.



In contrast, Stengel et al. discloses a method of **improving** the sensitivity of a receiver when the received signal is near or at the noise level range of the receiver. Referring to Fig. 1 of Stengel et al., reproduced herein above, a receiver (10) is shown having a received signal (11). The received signal and any receiver noise is filtered through a preselector (14) before being mixed with an injection signal from an oscillator (18). The oscillator (18) provides a suitable injection signal so that the received signal can be detected. Stengel et al. adds an unmodulated signal to the received signal when it is below a threshold.

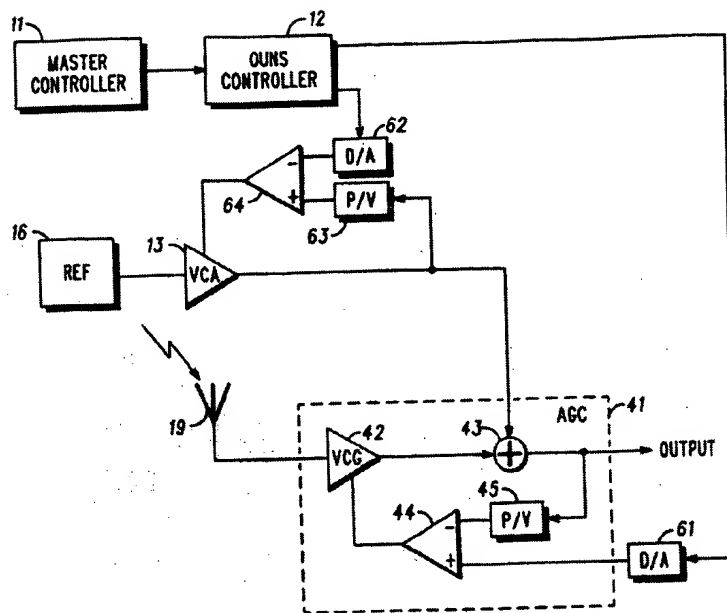
The Examiner, however, misplaces his reliance on Stengel et al. The injected signal simply does not raise the noise level on the receive path. Simply stated the injected signal of Stengel et

al. is not a **desensitization** signal. The recovered signal has a much greater signal-to-noise ratio, improving the sensitivity of the receiver. In applicants' claimed invention, the receiver is desensitized. That is, a desensitization signal is added to reduce the signal-to-noise ratio, reducing rather than increasing the sensitivity of the receiver.

The injection of the unmodulated signal suppresses the noise more than the desired signal when the received signal's amplitude resides at a level below the signal threshold. As a result, the recovered signal has a much greater signal-to-noise ratio. Therefore the sensitivity of the receiver improves.
Stengel et al., Col 2:32-37

As such, the injected signal of Stengel et al. is not a desensitization signal, but rather a means to recover the received signal from the noise level of the receiver. That Stengel et al. does not raise the noise level should not be surprising inasmuch as Stengel et al. sought to improve the sensitivity of the receiver. In contrast, applicants intentionally lower the sensitivity of the receiver. They do so that the source of the received signal, e.g., mobile units, can be made to transmit at a much higher transmission power than needed to ensure, for example, a proper boundary handoff, as discussed above herein.

The Examiner is simply mistaken that the injected signal of Stengel et al. is a "desensitization" signal, as recited in applicants' claimed invention.



On the other hand, Hall et al. discloses an "Other User Noise Simulator (OUNS)." In evaluating communication systems it is necessary to simulate the noise that would be present if the system were loaded to various capacities. Hall et al. discloses a receiver having an OUNS for effecting such a simulation. Referring to Fig. 4 of Hall et al., reproduced herein above, the receiver (40) contains an automatic gain control (AGC) (41) consisting of voltage control gain (VCG) device ((42) coupled to an input from the antenna (19). The output of the VCG (42) is coupled to a first input mixer (43). A second input of the mixer (43) is coupled to the output of VGA (13). The output of the mixer (43) provides the output for the AGC (41) as well as to one input of an operational amp (Op Amp) (44) through a power-to-voltage (45). A second input to the Op Amp (44) is provided from an OUNS controller (12) through a D/A converter (61).

In operation, the AGC (41) normalizes the RF input signal to

a known voltage or power level that is feed to an A/D converter. For example, if 50% loading is desired, the OUNS would contribute 50% of noise power to the demodulator. The AGC (41) would adjust all power received at the input to contribute 50% signal power to the demodulator. In effect, the received signal is provided to an automatic gain controller which normalizes the received signal to a known voltage level, along with a noise signal representing a desired noise level that simulates a desired loading.

As amended, applicants' claimed invention requires dynamically adjusting the power level of the desensitization signal based on the changing system operating parameters of the wireless communication system. In contrast, Hall et al. simply teaches how to simulate the noise that would be present if a wireless communication were loaded to various capacities. During testing, the injected noise is set depending on the simulated loading desired. The injected noise is not dynamically adjusted based on the actual operating parameters of the communication system, but rather on what the user wants them to be during testing. Nor is the power transmission level of the received signal adjusted based on the level of desensitization. Indeed, no information is transmitted to the source of the received signal about the transmission power. This should not be surprising since the problem sought to be solved by Hall et al. is substantially different than that sought to be solved by applicants. Applicants desensitize the receiver so as to raise the transmission power level of the received signal. As such, this ensures that the mobile unit transmits a sufficiently high signal power level under different conditions, such as a boundary handoff.

Applicants respectfully submit that their claimed invention, as amended, is nowhere remotely shown, suggested or taught in

either Stengel et al. or Hall et al. Neither reference, individually or in combination, meets all limitations of the claims. Nor is their claimed invention suggested by either Stengel et al. or Hall et. al.

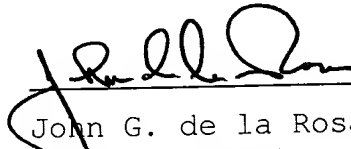
Furthermore, the other cited reference, namely, Menant does not remedy the deficiencies of either Stengel et al. or Hall et al. Menant nowhere remotely suggests desensitizing a receiver. Nor does Menant suggest or show adjusting the desensitization based on the operating parameters of the communication system.

In view of the remarks above, applicants believe independent claims 1 and 11 to be allowable under 35 U.S.C. §§102,103. Since independent claims 1 and 11 are allowable, it is believed that dependent claims 2-10 and 12-17 are also allowable.

Since this application is believed to be in condition for allowance, reconsideration and allowance are respectfully solicited.

Respectfully Submitted,
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Date: May 29, 2001

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims:

1. (Amended) In a wireless communication system, a [A] method of receiving a signal on a receiver path of a receiver, said method comprising the step of:

injecting a desensitization signal into said receive path to raise the noise level of said receive path relative to said signal level without attenuating the received signal on said receive path so as to desensitize the receiver;

adjusting the power level of the desensitization signal based on the changing system operating parameters of the wireless communication system; and

communicating to the source of the received signal a new power transmission level of the received signal based on the level of the desensitization signal.

11. (Amended) In a wireless communication system, a [A] receiver having a receive path for receiving a signal, said receiver comprising:

a desensitization signal source that is capable of producing a desensitization signal on a desensitization signal path; [and]

a coupler connected to said desensitization signal path and said receive path and injects said desensitization signal into said receiver path to raise the noise level on said receive path relative to the signal level without attenuating the received signal on said receive path so as to desensitize the receiver;

means for dynamically adjusting the power level of the desensitization signal based on the changing system operating parameters of the wireless communication system; and

means for communicating to the source of the received signal a new transmission power level of the received signal based on the level of the desensitization signal.